

Formative Research, Capacity Building, and Strategic Planning To Advance Smoke-Free Multi-Unit

Housing in North Carolina

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On our honor, we have neither given nor received unauthorized aid on this assignment.

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Abstract

Background: The Surgeon General has determined that there is no safe level of exposure to secondhand smoke (HHS, 2006). In apartments and condominiums, also known as multi-unit housing (MUH), secondhand smoke can travel through hallways, air ducts, and small spaces between units (HHS, 2009). There is evidence that low-income persons are disproportionately impacted by exposure to secondhand smoke in MUH (King, et al., 2009). We partnered with the Tobacco Control and Prevention Branch of the North Carolina Division of Public Health (TPCB) to promote the passage of smoke-free policies in multi-unit housing in North Carolina, particularly in affordable housing. **Methods:** We engaged the community of owners and managers of affordable MUH by interviewing and surveying them to learn their experiences with smoking policies and what benefits and barriers exist to implementing smoke-free policies. We also partnered with an affordable housing owner in Greensboro, NC, to survey his residents in order to learn their smoking habits and their attitudes toward smoke-free policies. We researched surveillance methods by which TPCB can track whether the proportion of MUH properties with smoke-free policies in NC changes over time. Furthermore, we created content for an online smoke-free MUH toolkit for the housing industry and for residents. Finally, we created a strategic plan TPCB can use moving forward to continue promotion of smoke-free policies in MUH in North Carolina. **Results:** Our key housing industry survey finding is that MUH owners and managers who have not yet implemented smoke-free policies perceive the difficulty of enforcement as a barrier, but that those who have implemented smoke-free policies find them relatively easy to enforce. Most respondents to our tenant survey reported that they do not smoke and would prefer to live in housing with smoke-free policies. Furthermore, we worked with a marketing firm to develop the toolkit website from the content we created. A key part of our strategic plan involves publicizing the existence of the website to MUH owners and managers in the state. **Discussion:** While the Capstone team and TPCB have preliminarily engaged the community of MUH owners and managers in NC on the issue of smoke-free housing, there

is still much work to be done educating them on the issue and providing tools they can use to implement smoke-free policies. It will be particularly important to bring together owners and managers who have successfully implemented smoke-free policies with those who want to learn more. A positive outcome is that the housing owner we worked with in Greensboro may be interested in implementing smoke-free policies in some of his properties as a result of the findings of the survey of his tenants. The online toolkit will be a valuable resource to TPCB as it works to share information with MUH owners, managers, and tenants across the state.

Deliverables

- 1) Housing Industry Survey Summary Results;
- 2) Multi-Unit Housing Tenant Survey Summary Results;
- 3) Memorandum to TPCB Summarizing Recommendations for Measuring Changes in Prevalence of Smoke-Free Housing in North Carolina;
- 4) Smoke-Free Housing Online Toolkit for Housing Industry Professionals and Tenants;
- 5) Strategic Plan for Advancing Smoke-Free Multi-Unit Housing in North Carolina.

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List of Commonly Used Acronyms

AHM	Affordable Housing Management
HUD	Housing and Urban Development, U.S. Department of
MUH	Multi-Unit Housing
NCAHC	North Carolina Affordable Housing Conference
PHA	Public Housing Authority
TPCB	Tobacco Prevention and Control Branch

Introduction

During the 2011-2012 academic year, we partnered with the Tobacco Prevention and Control Branch of the North Carolina Division of Public Health (TPCB) to complete this Capstone project. Capstone is a group-based, mentored, evaluated service-learning opportunity that partially fulfills the requirements for the MPH degree in the Department of Health Behavior at the University of North Carolina Gillings School of Global Public Health. The ultimate goal of our Capstone project was to increase the availability of smoke-free multi-unit housing (MUH) in North Carolina.

TPCB protects the health of North Carolina residents by promoting smoke-free environments and tobacco-free lifestyles (TPCB, 2012). TPCB has four major goals: 1) preventing initiation of smoking by young people; 2) eliminating exposure to secondhand smoke; 3) promoting smoking cessation among adults and youth; and 4) identifying and eliminating tobacco-related disparities among populations (TPCB, 2012). As we explain below, increasing the number of MUH complexes with smoke-free policies will help reach all four of TPCB's goals.

According to the U.S. Department of Health and Human Services (HHS; 2006; 2010), there is no risk-free level of exposure to secondhand smoke. Non-smoking tenants are often exposed to secondhand smoke in MUH, and TPCB has received complaints from tenants who are bothered by smoke exposure. Children and elderly persons make up more than half of the tenants in public housing, and these groups are especially sensitive to the negative effects of secondhand smoke (HUD, 2009). In North Carolina and other states, some MUH managers have implemented smoke-free policies to attract non-smoking tenants, to reduce operating costs, and to prevent fires and property damage. Although the exact proportion is unknown, there are many MUH complexes in North Carolina that continue to allow smoking in units.

Our Capstone team laid groundwork for incremental change toward smoke-free living in affordable and market-rate MUH complexes in North Carolina. This Capstone summary report begins

with a literature review to describe the public health burden of secondhand smoke exposure in MUH, the demonstrated benefits of smoke-free policies, and the strategies and procedures that the housing industry has used to implement smoke-free policies. Next, we describe our community engagement strategies and results and our plan to sustain our work beyond this academic year. We describe each of our major deliverables:

- A summary of the results of a survey conducted to assess housing industry knowledge and attitudes about smoke-free housing policies;
- A summary of the results of a survey to assess tenants' attitudes towards smoke-free housing policies, conducted at 13 properties owned by Affordable Housing Management, Inc. (AHM);
- A memorandum listing recommendations for TPCB to implement a baseline survey of MUH providers to identify the proportion of housing units with smoke-free policies in North Carolina;
- An online toolkit with resources for MUH owners and managers to learn about smoke-free policies, and to prepare, implement, and enforce these policies;
- A strategic plan for TPCB with the recommended next steps to advance smoke-free MUH in North Carolina.

We conclude by discussing the potential impact and benefits of our work, our key findings, and lessons learned.

Background

Public Health Burden of Secondhand Smoke

Secondhand smoke exposure causes 50,000 deaths each year in adult non-smokers in the United States (HHS, 2006). Secondhand smoke includes two types of smoke: smoke released from a burning cigarette and the smoke exhaled by smokers (HHS, 2006). According to the Surgeon General's report on involuntary exposure to cigarette smoke, secondhand smoke is harmful to health, and there is

no safe level of exposure (HHS, 2006). In children, second hand smoke exposure leads to respiratory problems, including asthma and lower respiratory infections (HHS, 2006). In non-smoking adults, secondhand smoke is known to cause cancer and heart disease (HHS, 2006; Kaur et al., 2004). Secondhand smoke has immediate negative effects on the cardiovascular system, and brief exposure can have harmful effects, particularly on elderly people and children (HHS, 2006). Furthermore, pregnant women exposed to secondhand smoke have an increased risk of a stillbirth or a child with a congenital malformation (Leonardi-Bee, 2011).

Secondhand Smoke Exposure in Multi-Unit Housing

For most Americans who are exposed to secondhand smoke, the home is the primary place of exposure (HHS, 2009). In MUH, secondhand smoke moves through hallways, air ducts, and small spaces between units (HHS, 2009). Secondhand smoke exposure can be measured in two ways: 1) by measuring indoor concentrations of airborne smoke, or 2) by measuring individual blood levels of cotinine, a biological method of assessing tobacco exposure (Kraev, 2009; Wilson et al., 2011). By measuring air samples, researchers have demonstrated that smoke traveling from smoking units causes tobacco contamination in non-smoking units and common areas (Kraev, 2009; King, 2010). In a nationally representative sample of children from non-smoking households, Wilson and colleagues (2011) examined blood cotinine levels and found that children living in apartments have higher levels of secondhand smoke exposure than children living in detached family homes.

In public housing, which includes fully subsidized and voucher-funded units, secondhand smoke is particularly problematic because of its impact on vulnerable populations. One study found that managers of properties subsidized by the Department of Housing and Urban Development (HUD) are twice as likely as managers of non-subsidized properties to receive non-smoking tenant complaints about tobacco smoke entering their units (King et al., 2009). Children and elderly persons make up

more than half of the tenants in public housing, and these groups are especially sensitive to the negative effects of secondhand smoke (HUD, 2009). In addition, groups of lower socioeconomic status tend to have poorer health, measured across many different indicators, than groups of higher status (Berkman & Kawachi, 2000). Smoking is one of the many factors that contribute to this disparity, as children and adolescents from low-income households are more likely to initiate smoking, and adults with lower income are less likely to quit smoking than those with higher incomes (Gilman, 2003). As Winickoff and colleagues argue, “A permissive smoking policy [in public housing] perpetuates such disparities and also increases the tobacco-smoke exposure of non-smokers in public housing, a group that has few alternative housing options available” (2010).

Impact of Smoke-Free Policies

According to a 2006 report by the Surgeon General, the only way to fully protect non-smokers from secondhand smoke is to eliminate smoking in indoor spaces (HHS, 2006). Air filtration and ventilation do not eliminate the health risks of secondhand smoke exposure in a MUH complex (HHS, 2006). They may improve air quality slightly, but they do not remove enough of the tobacco contamination from the air to make it safe to breathe (Sandel et al., 2010). Smoke-free housing policies are likely to produce substantial public health benefits, just as clean indoor air policies in bars, restaurants, and workplaces have improved public health. When smoke-free policies are implemented in bars and restaurants, hospitality workers show improvements in respiratory health and declines in biological markers of secondhand smoke exposure (Hahn, 2010). Among the general population, Pickett and colleagues (2006) found a dose-response relationship between tobacco exposure and clean indoor air laws: people who live in communities with comprehensive clean indoor air laws have lower levels of secondhand smoke exposure than people who live in communities with weak or non-existent laws. Emerging research demonstrates that lower levels of tobacco exposure result in improved health

outcomes. Several studies have measured statistically significant decreases in hospitalizations for acute myocardial infarctions (i.e. heart attacks) and acute asthma attacks following the implementation of clean indoor air laws in U.S. communities (Hahn, 2010; Sargent et al., 2004). Smoke-free policies also increase cessation rates among smokers. Workers are up to two times as likely to stop smoking if their workplace adopts a non-smoking policy (Bauer et al., 2005; Hopkins et al., 2010).

Smoke-Free Policies in Multi-Unit Housing

In recent years, government entities and public health advocates have begun to develop new initiatives to promote smoke-free MUH. In 2009 and 2010, HUD strongly urged Public Housing Authorities (PHAs) and managers of affordable housing units to implement smoke-free policies at their properties. Between January 2005 and February 2010, the number of PHAs with smoke-free policies in some or all of their buildings increased eight-fold, from 17 to 141 (Schoenmarklin, 2010). California, Oregon, and Minnesota, in particular, have been state leaders in this movement towards smoke-free housing.

In addition to the health benefits, smoke-free policies have financial benefits for housing managers. Specifically, smoke-free housing is less expensive to maintain than housing that allows smoking (Ong, 2011). To clean a unit where a smoker has lived, owners spend two to three times as much as when cleaning a non-smoker's unit (Winickoff et al., 2010). Costs related to smoking may include cleaning and repairs, trash removal, fire damage, fire insurance, other insurance, administrative costs, and operating costs. Property owners report that these costs are lower in buildings with complete smoking bans, but not in buildings with only partial smoking bans (Ong, 2011).

Perceived Barriers to Smoke-Free Policies and Opportunities for Intervention

Despite the advantages, many properties do not have smoke-free policies. Some managers may not have considered transitioning to smoke-free living, and some managers face barriers to policy change. There have been no nationwide surveys of property managers' attitudes towards smoke-free policies, but surveys have been completed at the city or county level in Massachusetts, Oregon, Washington, and New York (Hewett, 2007; King et al., 2010; Pizacani et al., 2011). These regional surveys of property managers have found that for those who do not have smoke-free policies, the primary barriers to implementing smoking policies are concerns about increased vacancy, decreased market share, and the legality of smoke-free policies (Hewett, 2007; King et al., 2010; Pizacani et al., 2011). Property managers who have implemented smoke-free policies are motivated by high demand for smoke-free units, happier tenants and less turnover, and lower insurance rates (King et al., 2010). These surveys offer promising guidance to those hoping to design an intervention for property managers, as many of the perceived barriers can be removed or reduced.

Manager concerns about the legality of smoke-free policies are often based on misinformation. It is important that property managers understand the legal issues surrounding smoking policies in private homes, from the federal and the state level. At the federal level, the courts have consistently upheld the view that smoking is not protected under the constitutional right to privacy, and smokers are not a protected class of citizens under the equal protection clause (Public Health Institute, 2004; Winickoff et al., 2010). Consequently, property owners have the legal backing to implement smoke-free policies in order to protect public health and the environment.

However, at the state level, there are questions as to whether PHAs may regulate smoking in public housing units (Elleveve Donahue, personal communication, 2011). In 2009, North Carolina became the first state in the southeastern region to pass a law prohibiting smoking in bars and restaurants. The law has had many public health benefits, but it also contained a provision stating that

local governments may not enact policies that restrict smoking in private residences (NC Gen. Stat. 130A-498(b1)(1), 2012). Since PHAs in North Carolina are considered local government entities, it is possible that PHAs would face legal challenges if they restricted or prohibited smoking in public housing units in the state. However, because PHAs were not specifically included in the law by the legislature, they may be exempt from the provision about regulating smoking in private residences. While clarifying this issue is an important policy problem for tobacco control advocates to confront in the future, our Capstone team chose to focus on market-based housing and affordable housing, not public housing, for this project. Individual owners of private housing properties, including those who accept state or federal funding for affordable housing programs, can legally create a smoke-free policy in some or all of their units.

Besides legal concerns, another major issue for property owners is the possibility that implementing smoke-free policies will alienate residents, create negative publicity, and limit market share (Hewett et al, 2007; King et al, 2009). Surveying residents in the local area can produce an accurate picture of market demand for smoke-free housing. If market research demonstrates that there are many renters who would prefer smoke-free living and that there are few smoke-free properties, there is a potential market opportunity for managers and owners. In New York, Minnesota, Washington and Oregon, surveys found that a majority of renters would prefer to live in a smoke-free apartment building, and up to one-third would be willing to pay more in rent to do so (Hennrikus et al., 2003; Hewett et al., 2007; King et al., 2010; Pizacani, 2011). However, current smokers may find smoke-free policies unfair, particularly if those policies are established after the tenant has chosen a building specifically because it allows smoking (Drach et al., 2010). Giving residents ample advance notice of the policy change, offering smoking cessation services for residents, and earning positive media coverage have been effective public relations strategies to minimize negative reactions (Pizacani, 2011).

Finally, managers have expressed concern about the enforcement of smoke-free policies (Hewett et al, 2007). At this point, there is no peer-reviewed literature about best practices in enforcement of smoke-free housing policies, but there are industry-recommended strategies (Laughter, 2011; Smoke-Free Housing Coalition of Maine, 2007). Trade organizations and experienced industry leaders recommend marketing smoke-free living aggressively in all advertising materials, adding clear language about the smoking policy to the lease agreement, posting smoke-free signage on the property, and responding promptly to resident complaints about non-compliance. If a resident is violating the smoking policy, managers may handle the situation as they would any other lease violation. This may include an informal discussion with the resident and one or more written warnings. Eviction, a time-consuming and costly process, is a last resort. (Laughter, 2011; Smoke-Free Housing Coalition of Maine, 2007)

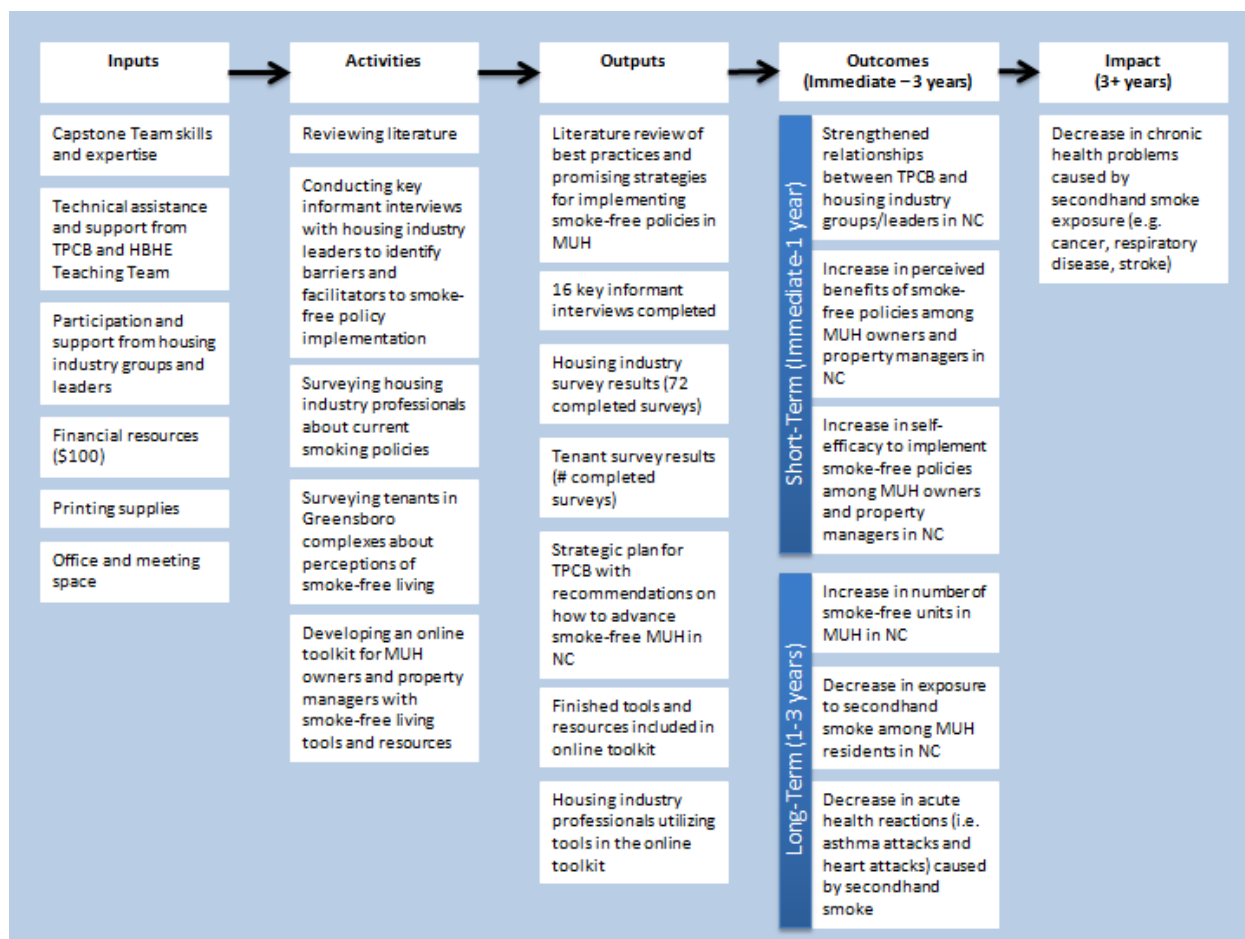
The evidence is clear that secondhand smoke exposure is a threat to public health, and secondhand smoke travels from smokers' units to non-smokers' units in MUH. Children, pregnant women, and elderly populations are particularly vulnerable to the effects of secondhand smoke. In affordable housing, secondhand smoke exposure exacerbates health disparities that impact low-income populations. MUH owners may have concerns about implementing smoke-free policies, including legality, vacancy rates, tenant reactions, and enforcement costs, but other property owners have successfully overcome these barriers in the transition to smoke-free living. With this background information, our Capstone team developed a work plan (Appendix A) with activities and deliverables designed to promote smoke-free MUH in North Carolina.

Methods

Project Logic Model

A logic model is a tool used to illustrate how a public health intervention works. According to the W. K. Kellogg Foundation (2004, p.3), “A program logic model links outcomes (both short- and long-term) with program activities/processes and the theoretical assumptions/principles of the program.” It explicitly shows the logic behind the program design. Creating a logic model is an important step in program planning, implementation, and evaluation (W.K. Kellogg Foundation, 2004). Our program logic model is depicted in Figure 1.

Figure 1. TPCB Capstone Project Logic Model



In the far left column of our program logic model, we have listed the resources and inputs that were necessary for our Capstone project. With these inputs, we carried out our program activities,

including reviewing literature, surveying and interviewing tenants and managers, and creating an online toolkit. Our outputs were the immediate products of these activities: the interviews conducted, the surveys completed, the tools created, the reports written. These outputs lead to the program's intended outcomes and impact. In the short-term, our program activities were designed to strengthen relationships between the housing industry and tobacco control advocates in the state, increase perceived benefits of smoke-free policies among housing industry leaders, and increase the self-efficacy of housing industry leaders to implement these policies, in other words, their perception that they can succeed. As a result, there will be more MUH complexes in the state that adopt smoke-free policies and less secondhand smoke exposure among North Carolina residents in MUH. Reduced exposure offers immediate public health benefits, including fewer asthma attacks and fewer heart attacks and long-term declines in tobacco-attributable chronic diseases, such as lung cancer, cardiovascular disease, and respiratory illnesses (Hahn, 2010; HHS, 2006; Sargent et al., 2004).

Planning for Sustainability

While developing our program logic model and choosing our intervention strategies, we planned for program sustainability. Sustainability has been defined as the extent to which an evidence-based intervention can be maintained and deliver its intended benefits over an extended period of time after the termination of external support (Rabin et al., 2008). Planning for sustainability in the initial stages of program development and monitoring sustainability over time enhance the long-term impact of an intervention. Ensuring sustainability is important to our Capstone work because as demand for smoke-free housing increases, there will be a continuing need for smoke-free housing resources and community engagement activities.

According to Shediak-Riskallah and Bone (1998), three types of indicators may be used to monitor sustainability: 1) maintenance of health benefits achieved through an initial program, 2) level of

institutionalization of a program within an organization, and 3) measures of capacity building in the recipient community. In our project, we conceptualized sustainability as the degree to which our smoke-free housing initiative will be institutionalized within TPCB and the degree to which we helped build the capacity of the housing industry to enact smoke-free policies.

In the planning process, we determined that developing an online toolkit for smoke-free MUH would be a cost-effective way to disseminate resources to stakeholders. Smoke-free housing initiatives in other states have used websites to facilitate communications with the housing industry, tenants, and condo owners. These toolkits often include educational materials, resource directories, and clear instructions on transitioning properties to smoke-free. Resources for tenants include strategies for working with property managers to promote policy change and a housing directory for renters searching for smoke-free properties. The toolkit fills a gap in TPCB's program activities and requires minimal staff time and maintenance costs after the initial development phase. We worked closely with the TPCB staff to ensure that TPCB has the resources to handle the basic upkeep of the website after our project has concluded.

Importance of Engagement

Community engagement is an important activity throughout health program development and implementation. The *Principles of Community Engagement*, a consensus guide published by the National Institutes of Health, states that the goals of community engagement are to “build trust, enlist new resources and allies, create better communication, and improve overall health outcomes as successful projects evolve into lasting collaborations” (McCloskey et al., 2011, p3). Practicing community engagement improves several aspects of a project, including the agenda, design and implementation. Engagement also enhances the level of involvement from various parties, which can lead to improved collaboration and dissemination and affect the overall success and uptake of the

program (Staley as cited in McCloskey et al., 2011). In this portion of the report, we describe our engagement and assessment activities, the results of these activities, and how these activities have shaped our project agenda, data collection tools, and dissemination plans.

Engagement and Assessment Activities

With the ultimate goal of increasing smoke-free MUH in North Carolina, the stakeholders in our community included affordable housing managers and property owners, as well as residents in affordable housing. We took a three-pronged approach to our community assessment activities: key informant interviews with managers and property owners, a survey of managers and property owners, and a resident survey. Additionally, and most importantly, our community engagement involved consistent communication with our housing industry partner, the owner of Affordable Housing Management Inc. (AHM), and a revision of goals based on his needs.

Our initial efforts focused on identifying a manager or property owner willing to be our partner in transitioning his or her property to smoke-free living. We followed up on leads gathered by TPCB at a housing conference in May 2011, but difficulties garnering interest in our project indicated a need to conduct formative research with the stakeholders in our community to understand more about the barriers, facilitators and motivation to implement smoke-free policies. Thus, we used in-depth qualitative interviews (n=15) and a survey (n=72) to understand the views of property managers and owners in North Carolina.

At the North Carolina Affordable Housing Conference (NCAHC), which took place on November 1 and 2, 2011, we surveyed property managers and owners attending the conference (n=72) about smoking policies at their properties. We asked managers who had implemented smoke-free policies (n=40) what motivated smoke-free policy implementation and what facilitated the transition process. We asked managers without smoke-free policies (n=32) about barriers to policy

implementation, and what resources would be helpful if they chose to move towards a smoke-free environment. The second purpose of the survey was to collect contact information of managers and property owners who were interested in receiving smoke-free living resources. In summary, the in-depth interviews, coupled with the survey at the NCAHC, allowed us to have a greater understanding of the barriers, facilitators, needs and assets of property managers and owners.

In addition to our survey and interview activities with the community of manager and property owners, we assessed the community of residents who live at the thirteen AHM properties. As part of a community assessment of AHM properties, we surveyed all AHM residents by mail to assess their attitudes towards smoke-free policies. We pre-tested the survey with a focus group (n=1) of 13 residents, mailed the survey to residents in all 13 properties (n=339) in March, and followed up with two reminder flyers. The assessment of residents has informed the owner and managers about resident readiness to move to smoke-free living. These results will help determine how, where, and to what extent smoke-free living is implemented at AHM's properties. We will share the results of the surveys with residents by presenting their community's general views on smoke-free living.

Lastly, throughout the year, we spoke with a variety of influential leaders in the housing industry to make connections and increase their awareness of smoke-free housing in North Carolina. These partners included the NC Housing Finance Agency, the Southeast Affordable Housing Management Association, the NC Housing Coalition, and the Apartment Association of NC.

Collective Purpose of Deliverables

In choosing the Capstone deliverables, TPCB and our Capstone team considered the strategic goals of TPCB, the capabilities of the student team, the political and social environment in North Carolina, and the results of our community engagement and sustainability planning efforts, discussed above. As mentioned in the introduction, promoting smoke-free multi-unit housing supports TPCB's

goals, particularly limiting exposure to secondhand smoke among North Carolinians. Our Capstone team brought qualitative and quantitative research experience, as well as community assessment techniques, writing skills, and social marketing experience to the project. When we began our work, we chose deliverables that used our strengths to promote smoke-free MUH by encouraging voluntary policy change in the private housing market.

Results

Summary of Deliverables

Table 1. Description of deliverables and key findings

Deliverable 1: Housing Industry Survey Summary Results	
Purpose: To gain knowledge about the housing industry, identify motivators and barriers to implementing smoke-free policies, and collect success stories from professionals with experience implementing smoke-free policies.	
Timing: September 2011-January 2012	
Methods	Key Findings
We administered a 12-item survey to a convenience sample (n = 72) of housing industry professionals who attended the NC Affordable Housing Conference in Raleigh in November. The survey was informed by in-depth interviews with housing industry members and asked respondents about current smoking policies at their properties, intentions to implement smoke-free policies in the future, perceived tenant attitudes towards smoke-free policies, barriers and motivations to implementing smoke-free policies.	Among smoke-free properties, the top reasons for implementing the smoke-free policy were fire risk, tenant health, and turnover costs. For those without policies, the major barriers to implementing a policy were concerns about enforcing smoke-free policies and reducing consumer demand. However, 84% of those with smoke-free policies said the policies had been received positively or neutrally, and only 12.5% said that enforcing the smoke-free policy was difficult. This indicates an opportunity to educate concerned owners and managers about the success stories of others in their industry.

Deliverable 2: Multi-Unit Housing Tenant Survey Summary Results
Purpose: To assess tenant attitudes toward SHS exposure in multi-unit housing, thus providing data to owner to allow him to determine the desirability and feasibility of transitioning to smoke-free housing.

Timing: October 2011-April 2012	
Methods	Key Findings
In March 2012, we administered a mailed survey to 320 tenants of the 13 properties owned by Affordable Housing Management, Inc. (AMH) in Greensboro, North Carolina. The 10-item survey measures tenants' attitudes toward SHS, current smoking behavior, and attitudes toward smoke-free policies in MUH.	The large majority of survey respondents said they do not smoke at all. Almost half of respondents reported a medical condition worsened by SHS. Importantly, the majority of respondents preferred smoke free living, including some smokers.

Deliverable 3: Memo to TPCB Summarizing Recommendations for Measuring Changes in Prevalence of Smoke-free Housing in North Carolina	
Purpose: To conduct formative research that will inform an implementation plan for a baseline survey that will allow TPCB to measure the changes in prevalence of smoke-free policies in affordable housing over time and evaluate its efforts.	
Timing: October 2011-March 2012	
Methods	Key Findings
We researched methods that have been used across the country to quantify prevalence of smoke-free policies in MUH, using a search of the literature and direct communications with tobacco advocates in other states. We also determined the existence of multiple sampling frames of affordable MUH properties in NC.	The most feasible method of determining the prevalence of smoke-free policies will be to conduct establishment surveys by phone of property managers, using property lists from HUD, the NC Housing Finance Agency, and the US Department of Agriculture.

Deliverable 4: Smoke-free Housing Online Toolkit for Housing Industry Professionals and Tenants	
Purpose: To develop a directory of resources (including electronic brochures, sample leases, cost-benefit analyses, posters, etc.) that will educate stakeholders and aid MUH owners in the transition to smoke-free housing.	
Timing: November 2011-March 2012	
Methods	Key Findings
We collected tools and resources from tobacco control advocates nationwide. We developed a website with resources (including electronic brochures, sample leases, cost-benefit analyses,	Based on our interviews with housing industry professionals, we divided the toolkit into sections that target housing professionals in different stages of readiness to make a policy change. The

posters, etc.) to educate stakeholders and aid MUH owners in the transition to smoke-free housing.	sections include: 1) “Read Success Stories” 2) “Learn about Smoke-Free Policies” 3) “Prepare for a Change” 4) “Implement the Policy” 5) “Enforce the Policy” and 6) “Market Your Smoke-Free Property.”
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Deliverable 5: Strategic Plan for Advancing Smoke-free Multi-Unit Housing in North Carolina	
Purpose: To offer recommendations for future steps TPCB can take to advance smoke-free MUH in North Carolina.	
Timing: February 2012-April 2012	
Methods	Key Findings
The Strategic Plan lists our recommendations for next steps that the TPCB can take to continue to promote smoke-free MUH in North Carolina. The Strategic Plan was informed by the activities completed by the Capstone team, and it incorporates the results of the surveys, focus groups, and interviews conducted in the fall and spring semesters.	The Strategic Plan includes three main strategic goals: 1) increase awareness about the benefits of smoke-free policies in MUH among the key decision-makers in the NC housing industry; 2) facilitate implementation of smoke-free policies in MUH; 3) increase recognition and visibility of North Carolina’s smoke-free housing properties.

Engagement and Assessment Results

Our engagement and assessment activities illustrated the diversity of strengths and resources, as well as weaknesses and challenges, experienced by managers and property owners (Table 2). By engaging with managers and property owners, we learned about their perceptions of barriers to smoke-free policy implementation. First, we learned that managers fear smoke-free policies will be unattractive to potential residents and thus decrease occupancy. This is problematic for them because housing subsidies are dependent on occupancy rates. Second, managers have other quality of life issues that they prioritize above smoke-free living, including gangs and illegal drugs, therefore tobacco control may not be a compelling issue with their limited time and resources. Finally, on a fundamental level, some managers do not agree with a policy that restricts where their residents can smoke.

We also spoke with housing managers who have successfully transitioned their properties to smoke-free living, and they shared a number of facilitators and motivators with us. Two major motivators for prohibiting smoking were preventing fires caused by cigarettes and reducing turnover costs from preparing a smoker's apartment for the next resident. Supportive residents, access to sample language for lease addendums, and sample tenant letters helped facilitate the transition. The results of these in depth interviews informed response options for our survey of housing managers and property owners at the NCAHC in November, as well as the contents of the online toolkit we created.

From our survey of affordable housing property managers and owners (n=72) at the NCAHC, we learned about knowledge, attitudes, beliefs and behaviors regarding smoke-free housing. Nearly half of the respondents were unaware or unsure of the HUD recommendation encouraging smoke-free housing. However, 56% had implemented a smoke-free policy in at least part of their properties and only 12.5% of them said that enforcing the policy was difficult. For those who had not implemented a smoke-free policy, 38% were concerned about policy enforcement, and 25% were concerned about reduced consumer demand. An information packet with smoke-free policy resources was the most requested item to help people move forward.

These data point to two pressing needs. First, managers and owners who have successfully enforced smoke-free policies can be informative resources for those who see enforcement as a barrier, and we see a benefit in TPCB facilitating occasions for them to meet in the future. Second, managers and owners who have not implemented smoke-free policies want to be connected with resources on this issue. Therefore, one of the goals of this project is to promote this exchange of information. In conclusion, this assessment will ensure that the contents of our online toolkit are relevant to the needs of the community, and it will inform recommendations we make to TPCB.

The second part of our engagement and assessment was with residents of AHM properties. Our survey to tenants received 122 out of a possible 334 (we received 5 surveys back as return to sender)

possible responses at the time of analysis for a response rate of 37%. The results suggest that smoking rates may be much lower in these complexes than anticipated by property managers, with 72.5% of respondents reporting they smoked cigarettes “not at all.” Prior to the survey, we received an estimate from one manager of a smoking rate of 80%.

Furthermore, our survey identifies residents in affordable housing as particularly vulnerable to SHS. Importantly, 47.03% of tenants report they or someone living in their home has a medical condition made worse by SHS. Considering that over half of non-smokers reported smelling smoke that came from outside their units at least one day in a typical week, each week there is potential for negative effects on those with medical conditions affected by SHS.

Finally, our survey examined whether tenants would prefer living in a building where smoking is allowed or a smoke-free building. The finding that 60% of all respondents would prefer a building where smoking is not allowed will be of particular interest to property owners who fear there is not substantial demand for smoke-free buildings. Surprisingly, 16% of respondents who are smokers reported they would actually prefer a smoke-free building and an additional 19% of were unsure of preference. The results may be promising for the AHM Inc property owner and others who are concerned about a mass exodus of tenants after they adopt smoke-free policies. Of smokers, who already represented a small subgroup of the tenant population, only 31% reported they would make plans to move if they were not allowed to smoke in their buildings. This percentage represents 9 respondents out of 117 responses.

Table 2. Strengths and weaknesses of manager/property owner community

Strengths	Resources	Weaknesses	Challenges
<ul style="list-style-type: none">- Established communication channels with tenants- Authority to implement a new policy- Close network of managers and property owners	<ul style="list-style-type: none">- Documents, advice from managers who have already implemented smoke-free policies- Financial resources to incentivize tenant response to surveys- Success and lessons learned from smoke-free bars/restaurants	<ul style="list-style-type: none">- Manager/owner lack of information about smoke-free housing and HUD recommendations- Divided teams: property owners who are on board and managers who are not	<ul style="list-style-type: none">- Negative views towards smoke-free policies- Legal and policy ambiguities- Concern about smoke-free policy enforcement

Impact and Lessons Learned in Community Engagement

Our community engagement activities led us to shift key aspects of our project plan. Originally, we attempted to identify a partner who was ready to implement a smoke-free housing policy. As we began speaking with managers, we realized that we needed to better understand managers' concerns and motivators before we could assist a property in implementing a smoke-free policy. Once we identified a partner, instead of setting the agenda to move his properties to smoke-free living, we listened to his goals for the partnership and incorporated them into our work plan.

As we moved forward with our partners, we remained mindful of their level of participation. Arnstein (1969) identifies different levels of community engagement that range from manipulation to citizen control and reflect varying degrees of citizen power in the research process. Initially, we interacted with our manager community in the manner Arnstein describes as "non-participation" (1969). We had a pre-conceived idea and wanted to "help" managers and tenants. This is why our strategy at the beginning of the project was largely unsuccessful. After forming a true

partnership in which our partner was able to negotiate the outcomes with us, we were able to move the project forward, out of non-participation and into the partnership characteristic of citizen power.

There were challenges incorporating our partner's goals into our program planning and design. First, it was difficult to balance the varying desires and needs of property owners, managers, and tenants with what is known to be healthy: limiting SHS exposure. Second, determining the scale of our engagement efforts proved difficult. Due to our limited time and resources, we decided to focus on affordable housing, specifically, on AHM's 13 properties in Greensboro.

Despite these challenges and lessons learned, our community engagement with tenants will have an impact on smoking policies and dialogue about the issue of smoking in MUH. We created the tenant survey to determine the level of tenant support to help the AHM Inc owner decide whether to implement a smoke-free policy. Our tenant survey results have been provided in a summary report to the owner. We will take special care in providing these results to note the 37% response rate and that the results may not be representative of the views of all residents. However, we are satisfied that the residents will have a voice in policy change in their community. In addition, by sharing these results with all AHM Inc residents, we hope to stimulate dialogue about the issue.

Sustainability Findings

According to Shediak-Riskallah and Bone (1998), programmatic approaches that influence sustainability can be organized into three categories: 1) project design and implementation factors, 2) factors within the organizational setting, and 3) factors in the broader community environment. We will explore each of these categories in the following sections.

Sustainability: Project Design and Implementation Factors

The key factors to consider in our project design and implementation are the project negotiation process, project effectiveness, project duration, and project financing (Shediak-Riskallah and Bone, 1998).

Through our community engagement efforts, we identified a partner with an interest in exploring smoke free policies. In the project negotiation process, we made an effort to ascertain and cater to the needs of our housing industry partner. Our work with this partner was driven by his priorities and needs, which should increase the likelihood that the final result will be acceptable to all parties. Additionally, the housing industry survey responses that we collected during the NC Affordable Housing Conference informed our program design, including the need for a resource directory.

The perceived effectiveness of implementing smoke-free policies was affected by managers' concerns over low tenant demand for smoke-free units, tenant resistance to policy change, and difficulty of policy enforcement. These concerns are particularly salient in the context of affordable housing, as data show that smoking rates are inversely related to income level (Gilman, 2003). We worked with an affordable housing property owner to survey his tenants regarding their smoking habits and their desire to live in smoke-free housing. By developing a survey and demonstrating the feasibility and low cost of its implementation, we created a template for other owners to conduct similar surveys among their own tenants. Evidence about the effectiveness of smoke-free policies was also included in our online toolkit.

Other components of our project were designed to increase project duration and financing. The report on a recommended methodology to create a baseline survey on the proportion of smoke-free MUH properties in NC will allow evaluation of TPCB's efforts to promote smoke-free policies. Evaluation of TPCB's work in this field will be critical for its continuation, both in terms of satisfying funders and for

program planning purposes. Finally, the strategic plan will assist TPCB in determining next steps in the smoke-free housing initiative, building on the progress achieved during this Capstone project.

Sustainability: Factors within the Organizational Setting

Our Capstone team is fortunate to have an established community partner in TPCB and a well-respected organizational champion in the head of TPCB, Sally Herndon. An organizational champion is a transformational leader that has the ability to clearly articulate a vision, attach meaning to an innovation, influence changes in others, and span the boundaries between various stakeholders (Hendy and Barlow, 2011; Howell and Higgins, 1990). TPCB is stable and well-funded, providing a strong organizational base for our Capstone project. Our smoke-free MUH project aligns with the TPCB's organizational goals and builds on past initiatives related to tobacco cessation, secondhand smoke, and smoke-free bars and restaurants. Sally Herndon has been the Branch Head of Tobacco Prevention and Control since 1991, giving her over twenty years of experience in tobacco policy and planning. With a strong organizational structure and a program champion in the leadership position, efforts to promote smoke-free MUH are expected to receive continued organizational support within TPCB in the future.

Furthermore, several aspects of the organizational structure of TPCB will positively influence the sustainability of our work. First, the NC Division of Public Health was one of seventeen states in the nation to be awarded a Community Transformation Grant by the Centers for Disease Control and Prevention (CDC) in September 2011. As part of this grant, the NC Division of Public Health has committed specifically to working on the issue of promoting smoke-free MUH, with an emphasis on affordable housing. Funding for this grant will continue for five years, so TPCB has dedicated funds for smoke-free MUH work until September 2016. Furthermore, TPCB works with eight local CDC-funded coalitions across the state on tobacco prevention and control issues. Therefore, in addition to state-level employees at TPCB, coalition employees will be able to continue outreach to MUH owners and

managers using the information on smoke-free housing and the toolkit developed as part of this Capstone project.

Sustainability: Factors within the Broader Community Environment

There are regular housing conferences in North Carolina that TPCB can attend to promote smoke-free MUH and continue the work started in this Capstone project. These forums provide periodic opportunities to recruit participants for data collection, locate allies, and identify sites for project collaboration, as well as to disseminate findings and marketing materials.

Our Capstone team worked to identify champions within the housing industry that would be able to promote our message and connect interested parties to our resources. For example, we identified a market-rate housing manager who had transitioned her properties smoke-free and was willing to be profiled as an example of a success story. Housing industry champions will play an important role in changing social norms around smoke-free housing by advocating for and modeling implementation of smoke-free policies within the professional housing associations. In addition, these champions can provide TPCB with industry insights and help TPCB build relationships with other industry stakeholders.

Politically, there is popular support for tobacco prevention programs and smoking bans in public places in North Carolina. A February 2012 poll conducted by Public Opinion Strategies found that 74% of North Carolina voters believe that tobacco settlement funds should be used to support the state's tobacco prevention and control programs (Bolger, 2012). Furthermore, the landmark passage of the smoke-free restaurants and bars law in 2009 has had a significant impact on public opinion. Although controversial at first, this law has become immensely popular since it was passed. A February 2011 survey administered by Public Opinion Strategies reported that 74% of North Carolinians from across the political spectrum are happy with the smoke-free restaurants and bars law (North Carolina Alliance for

Health, 2011). As a result of this law, social norms have changed as patrons in restaurants and bars have come to expect a smoke-free environment. Additionally, studies have shown that restaurant profits are not harmed by smoking bans, which corrects the misconception that such policies are bad for business (Glantz, 1999; Klein et al., 2010).

The arguments made on behalf of the smoking ban in restaurants and bars represent the latest attempt by tobacco control advocates to re-frame the issue of environmental tobacco smoke from the right to smoke to the right to breathe clean air. We believe that this shift will motivate non-smokers living in MUH to advocate for clean air in their homes, and landlords to be more sympathetic to their tenants' complaints about being bothered by smoke from a neighboring unit. By planning for sustainability throughout the Capstone project, our team is confident that this initiative will continue to grow after our work concludes in April 2012.

Discussion

Limitations and Strengths of Engagement and Assessment Activities

The team faced a few limitations that impacted our ability to use our findings to help TPCB move affordable housing complexes towards smoke-free policies. Our main limitation may be our inability to generalize our findings to a larger group beyond the affordable housing owners and tenants we have already engaged. Although all of our engagement activities were considered formative research, these limitations are worth discussing. First, we used a convenience sample of housing industry professionals at the NCAHC as our respondents. The attendees at this conference may not have been representative of affordable housing owners and managers statewide, and their answers may have differed systematically in some way from those of the target population we were trying to assess.

Second, of that sample, we were unable to determine a non-response rate and whether the non-responders differed in a systematic way from the responders. We distributed the surveys at seven

different conference sessions with audience members representing a wide variety of professions within the housing industry, including tax specialists, insurance specialists, general complex staff and other occupations that did not relate to managing or owning an apartment complex. Thus, while we could count the number of people in attendance at each session and the number of surveys turned in, we did not know how many of the attendants had declined to fill out the survey because they were not owners or managers and thus were not eligible, versus how many were eligible but had simply chosen not to respond. The sponsors of the conference estimated that the sessions we surveyed had a total of 500 attendees, but there was overlap of attendees between the seven sessions we attended. We received 72 completed surveys. This relatively low number raises concerns about whether our results reflect the attitudes of the owners and managers at the conference or merely those who had stronger feelings on the issue and were more likely to take the time to complete the survey. Additionally, although our survey was based on an extensive literature review and allowed space for open response, the choices we provided on the survey did not include all potential barriers or concerns for owners of affordable complexes going smoke-free in North Carolina.

Despite the limitations with respect to sampling and representativeness, our community engagement strategy had several strengths. For example, the open discussion in the tenant focus group allowed residents to mention ideas we had not read in the literature. For example, some respondents emphatically believed that cigarette smoke could not escape a bathroom and could not travel out of the unit if a fan was on. These ideas revealed to us an unexpected lack of knowledge about secondhand smoke among some tenants. Additionally, the focus group gave us a chance to attach faces and names to our project, and hear, first hand, the impact in people's lives. Hearing a first-hand account of how the smoke negatively impacted one resident was more powerful than reading statistics in an article.

Additionally, our engagement through formative research has helped open communication with key stakeholders in the industry. Managers who completed our survey at the conference and gave us

their contact information will be notified when our toolkit is available online, and some have provided us with additional information on their complexes. We advise TPCB to keep up these relationships in order to move smoke-free MUH forward in North Carolina.

We learned several lessons from our community engagement activities. Importantly, we learned about the structure and atmosphere of the large housing conferences that are held in the state. With people having very different roles and agendas and rushing from session to session, we learned the importance of making TPCB's efforts stand out from other events occurring at the conference. Many of the companies and organizations with tables at the event offered small incentives to get participants' attention, such as pens, water bottles or key chains. Although TPCB may not be able to secure funding for such items, exploring this option or other ways of having appeal may increase the success of future TPCB attempts to engage with conference attendees.

We also learned to reduce the time lag between collecting participant information and contacting them. Although a number of respondents to our November NCAHC survey indicated they would be willing to talk to us for a follow-up, as a result of the timing with the holidays and semester break, we did not attempt to contact them until January and February. Due to this delay, people may have been less eager to talk with us and we may have lost some momentum in our efforts to gain success stories and further engage owners.

We are pleased that we received data from the tenant survey to report back to the AHM Inc property manager suggesting that there is significant interest in smoke-free policies among residents. We also received several powerful comments to our open ended question expressing both strong pro-smoking and anti-smoking views. There are a number of ways to have achieved a higher response rate including providing additional incentives or designing survey implementation in a way that allowed us to follow up with non-responders. With a higher response rate we could feel more confident our responses were truly representative of the opinions of the tenants living in AHM properties. It is possible

that certain subgroups were more likely to respond to the survey. For example, non-smokers and tenants with medical conditions may have been more likely to respond because they viewed this as an opportunity to change something that really bothered them. Also, it is possible that some people did not disclose that they were smokers due to social desirability pressures; however, we believe this scenario was unlikely as respondents were informed that their responses were confidential. Conversely, it is possible smokers responded at a higher rate because they viewed this survey as a threat to existing policy that allows them to smoke in their homes.

Potential Impact & Benefits

Our work has three distinct groups of direct beneficiaries: the owner and property managers at AHM, current and future tenants at AHM properties, and TPCB. First, the managers at AHM benefit from understanding their tenants' views on smoke-free policies. Ideally, the surveys will identify which complexes are ready for an immediate transition to smoke-free living. Such a transition will have financial benefits for the owners of AHM properties, as it will reduce the risk of fire, decrease cleaning costs and reduce overall operating costs (Ong, 2011; Winickoff et al., 2010). Even if this initial round of surveys of AHM tenants does not identify specific buildings that are ready for an immediate transition to smoke-free housing, they will identify existing barriers that can be addressed and possibly make the transition easier in the future.

The residents of these properties have the direct benefit of being able to express their opinions anonymously regarding this issue and make their property managers aware of their views on smoke-free housing. Additionally, their feedback may lead to immediate transition to smoke-free living, providing them with positive short-term and long-term health benefits (HHS, 2006). As mentioned above, even if the survey results do not indicate that an immediate smoke-free transition is feasible for any units, the ground work will be laid for removing barriers and ultimately moving the complexes towards being smoke-free, a benefit for future residents (HHS, 2006).

For TPCB, there will be several benefits from our work this year. Our formative research at the housing conference, focus group with AHM tenants, and interviews with property managers and owners strongly influenced the development of our toolkit. This online toolkit will allow TPCB to serve as a powerful resource for property managers and owners throughout the state who are interested in transitioning to smoke-free living. The success stories published as part of our toolkit, as well as the ability of owners to connect with each other, will convince owners of affordable housing complexes without smoking policies that they too can go smoke-free. The resources provided on overcoming barriers will also serve owners once their decision is made. As more complexes implement smoke-free policies, cessation rates among residents and workers should increase (Bauer et al., 2005; Hopkins et al., 2010), aiding TPCB to achieve its goal of improving the health of North Carolinians.

In addition to the direct beneficiaries discussed above, our work may benefit members of the broader North Carolina community. Our toolkit will serve as a resource for owners and residents across the state with whom we have not had the opportunity to engage. On a larger scale, our toolkit may serve as a resource and motivation to other states in the US, as we were inspired by the toolkits from other states, including Minnesota and Maine. By providing this kind of resource in a southeastern state, other states with similar demographics or political atmospheres may be motivated to change and the toolkit helps build the capacity of the housing industry to enact smoke-free policies. Lastly, our work will be continued by a future Capstone team that will market our toolkit throughout the state, engage stakeholders on a broader scale, and evaluate the toolkit. In the future, TPCB can assess the impact of the online toolkit through webpage traffic statistics and online surveys. This work will further benefit TPCB in its mission to protect the health of North Carolina residents by promoting smoke-free environments and tobacco-free lifestyles (TPCB, 2011).

Overall Lessons Learned & Challenges

We experienced a number of challenges throughout the project, but we viewed these challenges as learning opportunities. The delay in finding a partner willing to move to smoke-free housing taught us the significance of being flexible and persistent when things are not going as initially planned. In this same vein, our work plan changed over the course of the academic year, as it became apparent that some plans would not be feasible and as other opportunities presented themselves. For example, we added the unexpected activity of conducting a survey at the NCAHC. This experience reinforced the importance of our maintaining high, yet flexible, expectations over the course of the project.

We also learned negotiation skills in working with our community partner. In this Capstone project, the housing owner initially resisted the idea of including an upfront \$1 cash incentive with the survey to tenants for participating in the survey. Research shows that an upfront cash incentive would be most likely to improve response rates in this situation, rather than giving respondents a gift card upon receipt of the survey (Dillman, Smyth, & Christian, 2008). Team members presented the case for an upfront incentive, which was accepted by the partner. Thus, while in the end there was no contention over how to implement the survey, we learned that sometimes the perspectives of community partners differ from the perspectives of academic researchers, and parties must be prepared to negotiate details of the project according to their values.

Our lessons learned also stem from successes we experienced. We found strong allies in the community, including housing owners who were happy to share their stories and government employees who went out of their way to help us conduct our housing conference survey. In this way, we learned that there can be great rewards from reaching out to the community for help.

Considerations for Sustainability

Some of the Capstone project components should be maintained to promote the sustainability and growth of the smoke-free MUH initiative in NC. First, we encourage property managers to implement tenant surveys in order to assess their tenants' attitudes toward smoke-free housing. This survey is available through the online toolkit, which also provides detailed instructions on how to administer the survey. Second, after the online toolkit is released to the public, TPCB staff should continue to work with MarketSmart, the website designers, to monitor website traffic and usage. Periodic monitoring will provide valuable information on how to improve the toolkit and to assess how well the toolkit is being promoted. Furthermore, this website will need to be updated if there are significant legal or social developments around smoke-free MUH in NC. Third, the housing manager survey should be conducted periodically to assess changes in attitudes, gather contact information for outreach purposes, and collect success stories to share with the community. Lastly, we helped TPCB develop a Capstone team project for the next academic year, which will build on our current progress. The next Capstone team will create a social marketing campaign, promote and evaluate the online toolkit, and implement surveys as needed.

The Capstone project also produced two documents that provide recommendations for TPCB; the memo to TPCB summarizing recommendations for measuring changes in prevalence of smoke-free housing in North Carolina and the strategic plan for advancing smoke-free MUH. We recommend using these documents in the planning of future TPCB activities to build on the work our Capstone team has completed this year.

Conclusion and Recommended Next Steps

In conclusion, our Capstone team spent the 2011-2012 academic year working with TPCB to increase the number of MUH complexes in NC with smoke-free policies. We engaged in extensive

community assessment and engagement activities in the affordable housing setting, and we created an online toolkit to share resources with MUH owners, managers, and tenants across the state in both affordable and market-rate housing.

We have a number of recommendations for future directions TPCB can take to promote smoke-free MUH in NC. First, we recommend increasing the awareness of the benefits of smoke-free policies among key decision-makers in the NC housing industry. It will be important for TPCB to continue outreach to housing industry leaders by attending housing conferences, making presentations to groups, and initiating one-on-one meetings.

Second, we see the need for TPCB to facilitate the implementation of smoke-free policies in MUH in NC. TPCB can plan forums that allow owners and managers to share stories about how to implement smoke-free policies, since we learned from our community engagement that they would prefer to learn from each other rather than from an institution of public health. TPCB can also aid implementation by ensuring that the online toolkit is posted, maintained, and well publicized. A future Capstone team will provide a valuable service by evaluating the usefulness of the toolkit and disseminating information about it to appropriate audiences.

Third, our team recommends increasing the recognition and visibility of the state's smoke-free MUH properties in order to facilitate demand for them. TPCB may want to develop a database of its own or to link to other housing databases. It may also consider reaching out to commercial databases to encourage them to prominently list properties' smoke-free status.

In conclusion, there are a number of steps TPCB can take to promote awareness of the benefits of smoke-free policies in MUH, facilitate implementation of smoke-free policies in MUH, and increase the visibility of smoke-free properties. This work may promote change at the policy level, providing health benefits to residents of MUH in NC for decades to come.

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Tobacco Prevention & Control Branch

Draft Capstone Work Plan

Updated 3.14.2012

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B. Working Title

Towards Smoke-Free Multi-Unit Housing in North Carolina

C. Capstone Project Description

According to the U.S. Department of Health and Human Services (HHS, 2006; 2010), there is no risk-free level of exposure to second-hand smoke (SHS). Children, pregnant women, older adults and individuals with heart or respiratory problems are especially at risk. Separating smokers from others and/or providing separate ventilation does not protect against the health risks of SHS. Many North Carolina residents complain to the Tobacco Prevention and Control Branch (TPCB) and to the media about secondhand smoke in multi-unit apartments and lack of support from managers/owner to find a valid solution to eliminate smoking. The U.S. Department of Housing and Urban Development (HUD, 2009) strongly encourages public housing authorities to adopt smoke-free policies to protect the health of residents. Private multi-unit housing managers in NC are interested in making units smoke-free as a marketing edge to the majority who are non-smokers and as a way to cut turnover and cleaning costs.

The Capstone team will help conduct community assessments and lay the groundwork for incremental change toward smoke-free policies in private and affordable housing in North Carolina.

D. Deliverables & Activities ¹

Deliverable I: Housing Industry Survey Summary Results

Purpose: To gain knowledge about the housing industry, identify motivators and barriers to implementing smoke-free policies, and collect success stories from professionals with experience implementing smoke-free policies.

Description: In the fall semester of 2011, we conducted 12 key informant interviews with property managers and owners and leaders of housing industry professional organizations. In spring 2012, we continued to conduct key informant interviews with housing managers who submitted contact information at the November Southeast Affordable Housing Conference (n = 30). From managers who own smoke-free properties, we gathered qualitative data about the transition process, motivations, and tenant reactions. From managers who do not have smoke-free policies, we learned about barriers to smoke-free living and desired resources or assistance. We also administered a 12-item survey to a convenience sample (n = 72) of housing industry professionals who attended the Southeast Affordable Housing Conference in Raleigh in November. The survey asked respondents about current smoking policies at their properties, intentions to implement smoke-free policies in the future, perceived tenant attitudes towards smoke-free policies, barriers and motivations to implementing smoke-free policies. A short summary of the survey results was presented to the TPCB.

ACTIVITIES	DATE COMPLETED
1.0 Developed interview guide for key informant interviews	September 14, 2011 <i>Updated iteratively, as needed</i>
1.1 Conduct key informant interviews with housing professionals	September 2011 – January 31, 2012

¹ Please note that our team did not assign specific project managers for each deliverable. All group members contributed to each deliverable.

1.2 Create survey instrument for housing professionals	October 25, 2011
1.3 Write and submit IRB application for survey	October 25, 2011
1.4 Conduct survey of housing professionals at NC Housing Conference in November	November 2, 2011
1.5 Communicate survey results to TPCB	January 6, 2012

Deliverable II: Multi-Unit Housing Tenant Survey Summary Results

Purpose: To assess tenant knowledge and attitudes about SHS exposure in multi-unit housing and the desirability and feasibility of transitioning to smoke-free housing.

Description: In March 2012, we administered a mailed survey to 339 tenants of the 13 properties owned by Affordable Housing Management, Inc. (AMHI) in Greensboro, North Carolina. The 10-item survey measured tenants' knowledge and attitudes about SHS, current smoking behavior, and attitudes about smoke-free policies in multi-unit housing. In November 2011, we pre-tested the survey with a focus group of residents (n = 13) at Windhill Apartments in Greensboro, one of the properties managed by AHMI. We developed a detailed implementation plan for the survey (including distribution, packaging, incentives, and return procedures) in January 2012 and received IRB approval. Surveys were mailed to residents on March 3.

ACTIVITIES	DATE COMPLETED
2.0 Identify pilot site and recruit management partner	October 25, 2011
2.1 Draft tenant survey instrument	November 18, 2011
2.2 Conduct focus group with tenants to pre-test survey	November 21, 2011
2.3 Revise and finalize survey instrument	January 25, 2012
2.4 Develop implementation plan for survey	February 3, 2012
2.4 Write and submit IRB application for tenant survey	February 8, 2012
2.5 Conduct survey of tenants at Affordable Housing Management, Inc. properties (13 properties)	March 3, 2012
2.6 Analyze data from tenant survey	March-April 2012
2.7 Distribute survey results and recommendations to community partners and teaching team	April 9, 2012

Deliverable III: Memo to TPCB Summarizing Recommendations for Measuring Changes in the Prevalence of Smoke-free Multi-Unit Housing in North Carolina

Purpose: To conduct formative research that will inform an implementation plan for a baseline survey that will allow TPCB to measure the changes in prevalence of smoke-free policies in affordable housing over time.

Description: We conducted formative research to inform the implementation of the survey. With our results, we offered recommendations to the TPCB about how to construct a sampling frame, devise a sampling strategy, select a survey mode, and collect data. When implemented, the data from this survey will allow TPCB to establish a baseline against which to measure future

data, so that TPCB can quantify changes over time in this industry as a result of the efforts of TPCB and others to promote smoke-free policies.

ACTIVITIES	DATE COMPLETED
3.0 Contact housing associations and organizations about using membership lists for sampling frame	December 2011
3.1 Consult with Mike Bowling about sampling strategies	Multiple meetings, Fall 2011
3.2 Report recommendations to TPCB	March 6, 2012

Deliverable IV: Smoke-Free Housing Online Toolkit for Housing Industry Professionals and Tenants

Purpose: To develop a directory of resources (including electronic brochures, sample leases, cost-benefit analyses, posters, etc.) that will educate stakeholders and aid multi-unit housing owners in the transition to smoke-free housing.

Description: In the fall of 2011, we began collecting resources from key informants in North Carolina and tobacco control advocates in other states. In partnership with TPCB and Warren Ortland of the Public Health Law Center, we created an outline for our toolkit and began organizing our resources in an online document sharing system. In spring 2012, we finalized our toolkit materials, presented our design recommendations to TPCB and their marketing firm. The website with our materials will be completed by June 2012.

ACTIVITIES	DATE COMPLETED
4.0 Create a system for sharing resources (Dropbox)	November 10, 2011
4.1 Develop outline of online toolkit materials	January 18, 2012
4.2 Meet with TPCB staff to discuss website design	January 20, 2012
4.3 Compile all toolkit resources and adapt for NC	February 29, 2012
4.4 Meet with website developer to submit final toolkit materials	March 2, 2012

Deliverable V: Strategic Plan for Advancing Smoke-Free Multi-Unit Housing in North Carolina

Purpose: To offer recommendations for future steps the TPCB can take to advance smoke-free multi-unit housing in North Carolina.

Description: The Strategic Plan will be informed by the activities completed by the Capstone team, and it will incorporate the results of the surveys, focus groups, and interviews conducted in the fall and spring semesters. The Plan will include our recommendations for next steps that the TPCB can take to continue to promote smoke-free multi-unit housing in North Carolina. We will specifically include recommendations for activities that could be completed by a future Capstone team from the Department of Health Behavior. The Strategic Plan, which includes recommended goals, objectives, and action steps for the future, is separate from Deliverable VI (Capstone Summary Report) which summarizes and reflects on completed activities.

ACTIVITIES	DATE COMPLETED
5.0 Assist TPCB to draft 2012-2013 Capstone proposal	February 3, 2012
5.1 Review results of surveys and interviews and compile results	March-April 2012
5.2 Develop objectives for future TPCB efforts	March 2, 2012
5.3 Finalize strategic plan	April 9, 2012

Deliverable VI: Capstone Summary Report

Purpose: To summarize and serve as a record of the Capstone experience.

Description: The Capstone Summary Report is a public record of the Capstone project. It describes all aspects of the Capstone project and the work completed by the team. The major sections include a literature review, a summary of our community engagement activities, a plan for sustaining our work beyond this academic year, a summary of each deliverable, an explanation of the potential impact and benefits of the project, and a reflection on key lessons learned.

ACTIVITIES	DUE DATES
6.0 Draft sustainability section	October 28, 2011
6.1 Draft introduction, literature review, logic model	November 9, 2011
6.2 Draft community engagement section	November 16, 2011
6.3 Draft Capstone Summary Report due for peer feedback	February 29, 2012
6.4 Draft Capstone Summary Report due	March 21, 2012
6.5 Submit final Capstone Summary Report	April 25, 2012

E. Important HBHE Principles

a. Theory-Grounded

Please explain how the Capstone project work will be grounded in theory.

We draw from the idea of reciprocal determinism: the idea that the environment shapes human behavior and human behavior also shapes the environment (Glanz et al, 2008). We will be encouraging an environmental change (smoke-free housing) that will discourage smoking behavior. As landlords and residents recognize the benefits of smoke-free housing, they may behave in new ways (e.g. lobbying for more smoke-free buildings) that encourage smoke-free environments, which will again affect behavior. This cyclical interaction between environment and behavior will continue. The project is firmly grounded in the Diffusion of Innovations Theory (Glanz et al, 2008). Specifically, we will target private owners of affordable multi-unit housing to be early adopters of our smoke-free housing pilot program. Completion of our project and dissemination of results will lay the groundwork for successful incremental change toward smoke-free housing policies in market-based and affordable housing in North Carolina.

b. Evidence-Based

Please explain how the Capstone project efforts will be evidence-based.

Our main goal, to protect the health of tenants by reducing second hand smoke exposure, is rooted in evidence of the negative health impacts of SHS (HHS, 2006; 2010). Secondly, we have a number of examples of promising practices to inform our project development, including evidence of successful programs from smoke-free workplace and public places (King et al, 2011; Pizacani et al, 2011).

c. Participatory

Please explain how the Capstone project efforts will involve the intended audience.

The success of our Capstone project is dependent on the involvement of managers and residents of multi-unit housing. We will design and conduct a community assessment of tenants and management staff at our pilot site to determine how smoke-free housing could be adopted in a way most in line with the goals and needs of managers and residents. It will be especially important to address the concerns of current smokers and we plan to include them as partners as we work toward our goal of smoke-free housing.

d. Public Health-Oriented

Please explain how the Capstone project work will impact public health.

Our project has the potential to have a large public health impact in North Carolina. By laying the groundwork to move towards smoke-free housing, we will decrease preventable deaths and disease due to SHS and improve the quality of life of NC residents in affordable multi-unit housing. We will set an example for other managers to do the same to improve the health of their residents.

e. Attention to the Potential for Sustainability and Dissemination

Which project outputs should be sustained after the Capstone project ends, how, and by whom? How will you share outcomes with stakeholders, relevant institutions, organizations, and individuals?

The team at TPCB will continue to work with public housing authorities and private owners of affordable multi-unit housing to move towards smoke-free housing in NC and to continue the projects we start. Current laws and policies around local government controlled public housing using HUD funding may be a barrier to dissemination and sustainability in those residences; thus, it will be especially important that we research and are aware of laws and policies applicable to moving smoke-free housing forward.

We plan to disseminate outcomes over the course of the project by:

- Reporting results of surveys to TPCB
- Posting resources we develop to the TPCB website;
- Presenting a strategic plan to the TPCB to guide future efforts to promote multi-unit housing

F. IRB Implications

Will you be conducting secondary data analysis or primary data collection? Do you plan to pursue additional activities with the same information for dissemination (e.g., conference paper, article)? Please refer to the IRB Guidance for Student Research and Class Projects document to determine whether or not you will need to do an IRB.

We will be collecting data from landlords and residents, and we may present or publish our results in the future. We submitted applications and received IRB approval for our survey at the Southeast Affordable Housing Conference and for our survey of tenants in multi-unit housing in Greensboro.

G. Roles & Responsibilities

The Capstone has four stakeholder groups: students, community partners, faculty advisers, and the HBHE Department, as represented by the Capstone teaching team. The roles and responsibilities for each of these groups are outlined in Appendix A. The student team has identified the following team members for the roles listed below:

- a. Teaching Team Liaison: Patrick Tang

- b. Community Partner Liaison: Anna Stein
- c. Faculty Advisor Liaison: Amy Reid
- d. Department Liaison: Clayton Velicer

H. Resources

a. Capstone Site Resources

The HBHE department will reimburse up to \$100 of certain expenses relating to the direct activities necessary to carry out the established deliverables of the Capstone team.

The following are available from the TPCB:

- Printing, postage
- Limited clerical support
- Work space/meeting space in Raleigh if necessary
- Conference call line

Our housing industry partner funded the mailing of the survey and the survey incentive to his tenants.

b. Capstone Partner Key Personnel

Name, Degree(s)	Title	Relationship to Capstone Team	Communication Plan
Elleveve Donahue, JD	Tobacco Control Attorney	Legal technical assistance	Formal update in the fall; as needed
Ann Staples	Communications Director	Website liaison	
Surveillance and evaluation team		Technical assistance for qualitative/quantitative data collection	

c. Consultants on Call

Name, Degree(s)	Title	Area(s) of Expertise
Jill Moore, JD		Public health attorney at UNC School of Government

I. Logistical Considerations

a. Timing

Are there any timing considerations that will be important for the student team to be aware of when working on this project and its deliverables?

There is a North Carolina Affordable Housing Conference on November 2. Students and faculty may be traveling during Winter Break from 12/17/11 to 1/8/12, so communication and project work may be delayed during this period.

b. **Travel**

What special travel considerations exist for the student team? If travel is required, who is covering that expense?

The pilot sites are located in Greensboro, NC. All members of the student team have cars and will attempt to carpool for required travel.

c. **Other**

Are there any other important issues that the Capstone team (students, faculty adviser, and community partner) or teaching team should know about this Capstone project and/or the deliverables?

Permissible Uses of Information

d. **Ownership of the Deliverables**

The Capstone partner owns the final deliverables. However, HBHE reserves the right to publicly list the organization as a Capstone partner, to keep copies of all Capstone teams' final deliverables for review by the HBHE community, and to include a brief project description in Capstone promotional materials. Please explain the degree to which students will be allowed to use the work produced in pursuit of their educational or professional careers (e.g., thesis, dissertation, manuscript). Describe the procedures for obtaining approval to disseminate the Capstone project deliverables. If there are certain data or products that cannot be disseminated, please list them here.

The Tobacco Prevention & Control Branch will have ownership over the deliverables produced for this Capstone project. Any publications that result from the project may be disseminated with approval from the community partner and faculty advisor.

e. **Authorship**

What are your plans for authorship if you produce publishable materials?

Authorship of publishable materials will be decided based on the contributions of student team members.

f. **Use of Recorded Materials**

Who (e.g., Capstone partner, HBHE, students) can use the photographs, recordings, interviews, or auditory recording created by HBHE MPH Students during their Capstone projects?

Project-related recorded materials will be accessible only to the staff approved by the Capstone partner. Generated materials from project work will be owned by the Capstone partner. Requests to use these materials for presentations or other student use will be considered on a case-by-case basis.

J. References

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